ROM Cost and Waste Volume Estimating

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ROM Cost Estimating

- Decommissioning costs are estimated based on building square footage and selection of system factors
- Deactivation and S&M costs are estimated based on the estimated decommissioning cost

Deactivation and S&M Cost Estimates

- Deactivation = 10% of the decommissioning cost estimate
- Pre-Deactivation S&M Initial Year Estimate = 3% of the total decommissioning cost estimate
- S&M cost estimate escalates at 5% per year due to facility degradation
- Deactivation S&M Final Year Estimate = 25% next to last year deactivation S&M estimate
- No S&M cost during or after decommissioning

Decommissioning Cost Estimate

Decom Cost = (Base Demolition Rate)(Size)(ACM)(Haz)(Rad)(Sys)(Type)(Chrtz)(Ent)(SCF)

- Base Demolition Rate is the based on decommissioning cost experience ($/sq-ft).
- Size Factor equals foot print times number of floors (sq-ft).
- Asbestos Containing Material (ACM) Factor takes into account the presence of asbestos hazards.
- Hazardous (Haz) Factor takes into account chemical hazards.
- Radiological (Rad) Factor takes into account radiological hazards.
- System (Sys) Factor takes into account building systems complexity.
- Building Type (Type) Factor takes into account the type of building materials used for construction.
- Characterization (Chrtz)Factor takes into account the level of characterization to be performed on the building.
- Entombment (Ent) accounts for the cost savings that can be realized by entombment.
- Site Correction Factor (SCF) accounts for differences in local site labor rates.

Base Demolition Rate ($/sq-ft)

Cost to decommission a clean, reinforced concrete building (based on actuals ~ 25 projects at the INEEL)

500 - 1000 sq-ft	$127/sq-ft
1000 - 5000 sq-ft	$ 92/sq-ft
>5000 sq-ft	$ 52/sq-ft

$$SCF = \frac{\text{Local Site Average Burdened Labor Rate}}{\text{Data Model Average Burdened Labor Rate*}}$$

* $60/hr = INEEL average burdened composite labor rate

Cost Factors

Factors	Hi	Avg	Low
ACM	2.39	1.69	1.0
Hazardous	1.4	1.25	1.0
Radiological	2.2	1.7	1.35
System	2.0	1.4	1.0
Characterization	1.48	1.42	1.37

Building Type Reduction Factors	
Concrete	1.0
Concrete block	0.8
Steel	0.77
Misc.	0.5

Entombment Factors	
Entombment Done	0.5
Entombment Not Done	1.0

ROM Waste Volume Estimating

- Decommissioning waste volumes are estimated based on building square footage, a waste-type factor, and selection of adjustment factors similar to those used to estimate costs.

- Deactivation waste volume estimate is assumed to be 10% of the decommissioning waste volumes.

ROM Waste Volume Estimate

Volume for Each Type of Waste = (Building Size)(Waste Factor)(Adjustment Factors)

Waste volume adjustment factors for radioactively contaminated facilities

Waste Type	Waste Factor (ft^3/ft^2)	Adjustment Factor Categories	W-SYS	W-HAZ	W-ENT[1]	W-ACM	W-RAD
Combustible and Compactable LLW	0.0479	Low	1.00	*	0.100	0.95	1.00
		Average	1.40	*	*	1.00	1.70
		High	2.00	*	1.00	2.39	2.20
Non-Compactable LLW	1.296	Low	1.00	*	0.100	0.95	1.00
		Average	1.40	*	*	1.00	1.70
		High	2.00	*	1.00	2.39	2.20
Hazardous Waste	0.000316	Low	1.00	1.10	0.100	*	*
		Average	1.40	1.25	*	*	*
		High	2.00	1.40	1.00	*	*

*Not applicable. Default value of 1.00 is applied.
[1]If entombment is employed the appropriate value is 0.1, if not 1.0 should be applied.

ROM Waste Volume Estimate (cont.)

Volume for Each Type of Waste = (Building Size)(Waste Factor)(Adjustment Factors)

Waste volume adjustment factors for radioactively contaminated facilities.

Waste Type	Waste Factor (ft^3/ft^2)	Adjustment Factor Categories	W-SYS	W-HAZ	W-ENT[1]	W-ACM	W-RAD
Mixed Waste	0.000609	Low	1.00	1.10	0.100	*	1.35
		Average	1.40	1.25	*	*	1.70
		High	2.00	1.40	1.00	*	2.20
Landfill Industrial	1.26197	Low	1.00	*	0.100	0.95	1.00
		Average	1.40	*	*	1.00	0.588
		High	2.00	*	1.00	2.39	0.455
Landfill Asbestos	0.023300	Low	1.00	*	0.100	0.95	1.00
		Average	1.40	*	*	1.00	0.588
		High	2.00	*	1.00	2.39	0.455

*Not applicable. Default value of 1.00 is applied.
[1] If entombment is employed the appropriate value is 0.1, if not 1.0 should be applied.

Idaho History

- ROM Model developed by INEEL decommissioning operations program
- Over 1500 facilities estimated
- Used for D&D long-range planning
- Used as an input to site-wide planning

Savannah River Implementation

- SRS needed better basis for long-term projections
- Grouped over 900 facilities into 32 groups
- Spreadsheet version implemented in FY00
- Visual Basic version implemented in FY01
- D&D basis for budget and planning input
- Site Correction Factor = 1.2

Hanford Comparison

- Compared ROM Model results for 20 facilities in Hanford Site 300 Area Accelerated Closure Project Plan HNF-6465
- Hanford personnel provided adjustment factors for ROM input
- Site Correction Factor = 1.2

Hanford Comparison Results

- Total programmatic numbers evaluated
- Cost estimate

		ROM	ACP
- Total costs	-20.4%	$258.6M	$325.0M

- Waste volume estimates in cubic meters

		ROM	ACP
- LLW	-1.5%	69,989.6	71,090.5
- Ind. Landfill	+3.2%	34,559.0	33,496.6
- Hazardous	-96.1%	11.8	303.2
- Mixed	-93.5%	44.7	688.2

Other Complex-Wide Activities

- Portsmouth
- Mound
- Albuquerque sites
- ACE Team